



Big Valley Band of Pomo Indians

Summary of the 2021 Clear Lake HAB events

The Clear Lake Cyanotoxin Monitoring Program <https://bit.ly/ClearLakeCyanoProgram> which was begun by Big Valley and Elem Indian Colony in 2014 continued with its biweekly sampling for summer 2021. Most likely due to drought and other factors, we began seeing Anatoxin-a, a potent neurotoxin, in multiple locations on the lake. One site (SHADY01 – a recreational location on Cache Creek which is the outflow of Clear Lake) continued to have ever increasing Anatoxin-a detects from August through September. The levels of Anatoxin-a reached Warning levels at this site, with a result value of 35.42 µg/L. Microcystin results also reached the highest levels we've seen on Clear Lake with one site (LC01 – a private Homeowners Association shoreline) reaching a result value in August of 25,843 µg/L which is 32,000 times higher than the State recreational standards, and another site (RED01 – a public park in the City of Clearlake with boat launching and fishing off the shore) reaching a result value of 160,377.50 which is over 200,000 times higher than State recreational standards.

The cyanobacteria blooms varied throughout the year, with Microcystin producing *Microcystis sp.* and *Gloeotrichia sp.*, Cylindrospermopsin and Saxitoxin producing *Microseria sp. wollei* (prev. Lyngbya) and Anatoxin-a producing *Planktothrix sp.*, *Aphanizomenon sp.* and *Phormidium sp.* <https://bit.ly/CyanobacteriaToxinsChart>

In 2021, our monitoring program became an extremely useful tool which identified the more than 400 at-risk private/individual drinking water systems on Clear Lake. Because of the unprecedented Microcystin and Anatoxin-a toxin levels on Clear Lake, Lake County Public Health issued a Health Advisory on September 16, 2021 of Do Not Drink the tap water for these individual homes (specifically in the Oaks and Lower arms) that draw their drinking water from Clear Lake. Alternate sources of tap water were set up for these homes. <http://www.lakecountyca.gov/Government/PressReleases/11172021.htm> The Health Advisory was lifted by the Public Health Officer on November 16, 2021 for these homes. <http://www.lakecountyca.gov/Government/PressReleases/11172021.htm>

The 18 Public Water systems (serving 15 or more residences) which pull and treat water from Clear Lake were also under a State Water Resources Control Board Order with a results based schedule of monitoring their intake and treated water. Requirements of meeting US EPA's 2015 Drinking Water Health Advisory for Microcystins threshold of 0.3 µg/L were met by all the Public Water Systems, there were no exceedances of this Health Advisory. <https://bit.ly/EPAMicrocystinHealthAdvisory>



2021 Clear Lake Cyanotoxin Sampling Signage Recommendations

| SITE ID | ARM | 4/27/2021 | 5/17/2021 | 6/7/2021 | 6/21/2021 | 7/14/2021 | 7/28/2021 | 8/11/2021 | 8/25/2021 | 9/7/2021 | 9/21/2021 | 10/12/2021 | 10/26/2021 | 11/16/2021 | 12/8/2021 |
|----------|-----|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|----------|-----------|------------|------------|------------|-----------|
| AP01 | L | CAUTION | NONE | NONE | CAUTION | CAUTION | DANGER | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | CAUTION | N/A |
| BP | L | NONE | NONE | CAUTION | CAUTION | CAUTION | CAUTION | WARNING | CAUTION | CAUTION | DANGER | WARNING | WARNING | NONE | CAUTION |
| BVCL6 | U | CAUTION | NONE | NONE | NONE | NONE | CAUTION | NONE | CAUTION | CAUTION | CAUTION | NONE | NONE | NONE | NONE |
| CL-1 | U | N/A | N/A | N/A | N/A | N/A | N/A | NONE | N/A | NONE | N/A | NONE | N/A | NONE | NONE |
| CL-3 | L | NONE | N/A | N/A | N/A | NONE | N/A | DANGER | N/A | DANGER | N/A | WARNING | N/A | NONE | NONE |
| CL-4 | O | N/A | N/A | N/A | N/A | NONE | N/A | N/A | N/A | N/A | N/A | NONE | N/A | CAUTION | NONE |
| CL-5 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| CLOAKS01 | O | NONE | NONE | CAUTION | CAUTION | NONE | WARNING | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | CAUTION | CAUTION |
| CLV7 | U | CAUTION | NONE | CAUTION | CAUTION | NONE | NONE | CAUTION | CAUTION | DANGER | CAUTION | NONE | NONE | NONE | N/A |
| CP | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| ELEM01 | O | N/A | N/A | DANGER | DANGER | CAUTION | DANGER | DANGER | DANGER | CAUTION | CAUTION | DANGER | N/A | CAUTION | CAUTION |
| GH | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| HB | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| JB | L | N/A | N/A | WARNING | CAUTION | WARNING | WARNING | WARNING | DANGER | DANGER | DANGER | DANGER | CAUTION | NONE | N/A |
| KEYS01 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| KEYS03 | O | CAUTION | WARNING | DANGER | WARNING | WARNING | CAUTION | DANGER | CAUTION | CAUTION | N/A | N/A | NONE | NONE | N/A |
| KP01 | U | CAUTION | NONE | CAUTION | CAUTION | NONE | WARNING | WARNING | CAUTION | WARNING | CAUTION | NONE | NONE | NONE | NONE |
| LA-03 | L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | WARNING | N/A | NONE | N/A | N/A | N/A |
| LC01 | L | N/A | WARNING | CAUTION | WARNING | WARNING | WARNING | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | CAUTION | N/A |
| LPTNT | U | CAUTION | NONE | CAUTION | NONE | CAUTION | WARNING | DANGER | DANGER | WARNING | WARNING | CAUTION | CAUTION | CAUTION | NONE |
| LS2 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| LUC01 | U | CAUTION | NONE | NONE | NONE | NONE | NONE | CAUTION | NONE | CAUTION | NONE | NONE | NONE | NONE | N/A |
| NR-02 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | NONE | N/A | N/A | N/A |
| OA-04 | O | N/A | N/A | N/A | N/A | N/A | WARNING | N/A | N/A | WARNING | N/A | DANGER | N/A | N/A | N/A |
| RED01 | L | CAUTION | CAUTION | DANGER | WARNING | DANGER | WARNING | WARNING | DANGER | DANGER | DANGER | DANGER | DANGER | CAUTION | CAUTION |
| RODS | U | NONE | NONE | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| SBMME01 | O | CAUTION | CAUTION | N/A | CAUTION | CAUTION | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | N/A |
| SC01 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| SHADY01 | L | WARNING | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | WARNING | NONE | NONE | CAUTION |
| UA-01 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | NONE | N/A | N/A | CAUTION |
| UA-06 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | NONE | N/A | N/A | N/A |
| UA-07 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| UA-08 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | NONE | N/A | N/A | N/A |
| UBL | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

All cyanotoxin monitoring conducted by Big Valley Band of Pomo Indians with assistance from Robinson Rancheria. Signage Recommendations are based on lab results of microcystin toxin values at the site. https://mywaterquality.ca.gov/habs/resources/habs_response.html#advisory_signs_guidance

N/A: not sampled None: < 0.8 µ/L Caution: 0.8 µ/L to < 6.0 µ/L Warning: 6.0 µ/L to <20 µ/L Danger: > 20 µ/L



Microcystin and Anatoxin Results for 2021 Clear Lake Sampling

| | | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | MC | ANA | | | |
|----------|-----|--------------|------|--------------|------|--------------|-----|--------------|------|--------------|------|---------------|-------------|---------------|-------------|-----------------|--------------|------------------|--------------|----------------|--------------|---------------|--------------|--------------|-------|--------------|-------|-------------|-------------|-----|
| SITE ID | ARM | 4/27 | 4/27 | 5/17 | 5/17 | 6/7 | 6/7 | 6/21 | 6/21 | 7/14 | 7/14 | 7/28 | 7/28 | 8/11 | 8/11 | 8/25 | 8/25 | 9/7 | 9/7 | 9/21 | 9/21 | 10/12 | 10/12 | 10/26 | 10/26 | 11/16 | 11/16 | 12/8 | 12/8 | |
| AP01 | L | N/A | N/A | N/A | N/A | 0.19 | N/A | 3.13 | N/A | 2.01 | N/A | 370.40 | N/A | 33.16 | N/A | 45.22 | N/A | 4857.00 | N/A | 25.71 | N/A | 8.63 | N/A | 9.47 | N/A | 0.98 | N/A | N/A | N/A | |
| BP | L | N/A | N/A | N/A | N/A | N/A | N/A | 1.94 | N/A | 1.45 | N/A | 1.19 | N/A | 16.15 | N/A | 2.21 | N/A | 1.26 | N/A | 24.71 | N/A | 8.77 | N/A | 6.61 | N/A | 0.69 | N/A | 1.08 | N/A | |
| BVCL6 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.69 | N/A | 1.22 | 2.49 | 0.63 | ND | 2.84 | N/A | 1.84 | N/A | 1.09 | 0.17 | 0.52 | ND | N/A | N/A | N/A | N/A | N/A | N/A | |
| CL-1 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.18 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| CL-3 | L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | asked for | N/A | N/A | N/A | 24.17 | N/A | N/A | N/A | 4940.00 | N/A | N/A | N/A | N/A | N/A | 16.67 | ND | N/A | N/A | N/A | N/A | |
| CL-4 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 4.44 | N/A | N/A | N/A | |
| CL-5 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| CLOAKS01 | O | N/A | N/A | 0.31 | N/A | N/A | N/A | 1.40 | N/A | 0.40 | N/A | 13.55 | N/A | 42.35 | N/A | 56.74 | N/A | 29.39 | N/A | 1449.50 | N/A | 6.35 | N/A | 17.61 | N/A | 2.73 | N/A | 1.89 | N/A | |
| CLV7 | U | N/A | N/A | N/A | N/A | N/A | N/A | 4.69 | N/A | 0.45 | N/A | 0.68 | N/A | 1.72 | N/A | 3.42 | ND | 5910.30 | N/A | 1.33 | 0.17 | 0.46 | ND | N/A | N/A | N/A | N/A | N/A | N/A | |
| CP | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| ELEM01 | O | N/A | N/A | N/A | N/A | 25.00 | N/A | 43.37 | N/A | 5.36 | N/A | 72.04 | N/A | 56.09 | N/A | 786.60 | N/A | 5.67 | N/A | 5.86 | 0.27 | 517.20 | N/A | N/A | N/A | N/A | 2.58 | N/A | 1.55 | N/A |
| GH | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| HB | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| JB | L | N/A | N/A | N/A | N/A | 19.68 | N/A | 3.18 | N/A | 9.73 | N/A | 17.29 | N/A | 7.66 | N/A | 43.05 | N/A | 34.35 | N/A | 39.07 | N/A | 24.63 | N/A | 5.56 | N/A | 0.65 | N/A | N/A | N/A | |
| KEYS01 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| KEYS03 | O | N/A | N/A | 14.52 | N/A | 30.00 | N/A | 17.11 | N/A | 11.89 | N/A | 2.17 | N/A | 24.06 | 0.19 | 4.05 | 0.14 | 0.44 | 0.30 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| KP01 | U | N/A | N/A | 0.30 | N/A | N/A | N/A | N/A | N/A | 0.44 | N/A | 13.05 | N/A | 7.98 | N/A | 5.10 | N/A | 7.53 | N/A | 2.96 | 0.25 | 0.27 | ND | N/A | N/A | N/A | N/A | N/A | N/A | |
| LA-03 | L | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 15.09 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| LC01 | L | N/A | N/A | 11.16 | N/A | 1.69 | N/A | 8.26 | N/A | 17.41 | N/A | 14.67 | N/A | 49.64 | N/A | 25843.50 | N/A | 204.00 | N/A | 71.60 | 0.32 | 8.54 | ND | 9.16 | N/A | 1.32 | N/A | N/A | N/A | |
| LPTNT | U | N/A | N/A | 0.20 | N/A | N/A | N/A | N/A | N/A | 2.03 | N/A | 12.76 | N/A | 135.02 | N/A | 31.25 | 0.14 | 13.56 | 0.27 | 11.71 | 0.17 | 1.13 | ND | 0.82 | N/A | 0.84 | N/A | 0.34 | N/A | |
| LS2 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| LUC01 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.65 | 0.18 | 0.70 | ND | 2.79 | N/A | 0.78 | N/A | 0.32 | ND | N/A | N/A | N/A | N/A | N/A | N/A | |
| NR-02 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 2.64 | N/A | |
| OA-04 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 9.20 | N/A | N/A | N/A | N/A | N/A | 8.76 | N/A | N/A | N/A | 23.12 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| RED01 | L | N/A | N/A | 3.61 | N/A | 33.45 | N/A | 7.23 | N/A | 35.59 | N/A | 7.08 | N/A | 9.52 | N/A | 20.96 | N/A | 160377.50 | N/A | 144.00 | N/A | 33.18 | N/A | 25.11 | N/A | 3.49 | N/A | 1.64 | N/A | |
| RODS | U | N/A | N/A | 0.23 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| SBMMELO1 | O | N/A | N/A | 2.90 | N/A | N/A | N/A | 1.82 | N/A | 2.03 | N/A | 113.80 | N/A | 36.85 | N/A | 365.70 | N/A | 54.80 | N/A | 39.73 | N/A | 506.60 | N/A | 12.07 | N/A | 10.70 | N/A | N/A | N/A | |
| SC01 | O | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| SHADY01 | L | 17.34 | N/A | 59.65 | N/A | 87.67 | N/A | 21.41 | N/A | 66.10 | N/A | 51.25 | N/A | 25.33 | 2.63 | 22.69 | 12.90 | 22.40 | 25.95 | 87.78 | 33.61 | 19.48 | 35.42 | ND | ND | N/A | N/A | 0.36 | N/A | |
| UA-01 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 0.17 | |
| UA-06 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| UA-07 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| UA-08 | U | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |
| UBL | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | |

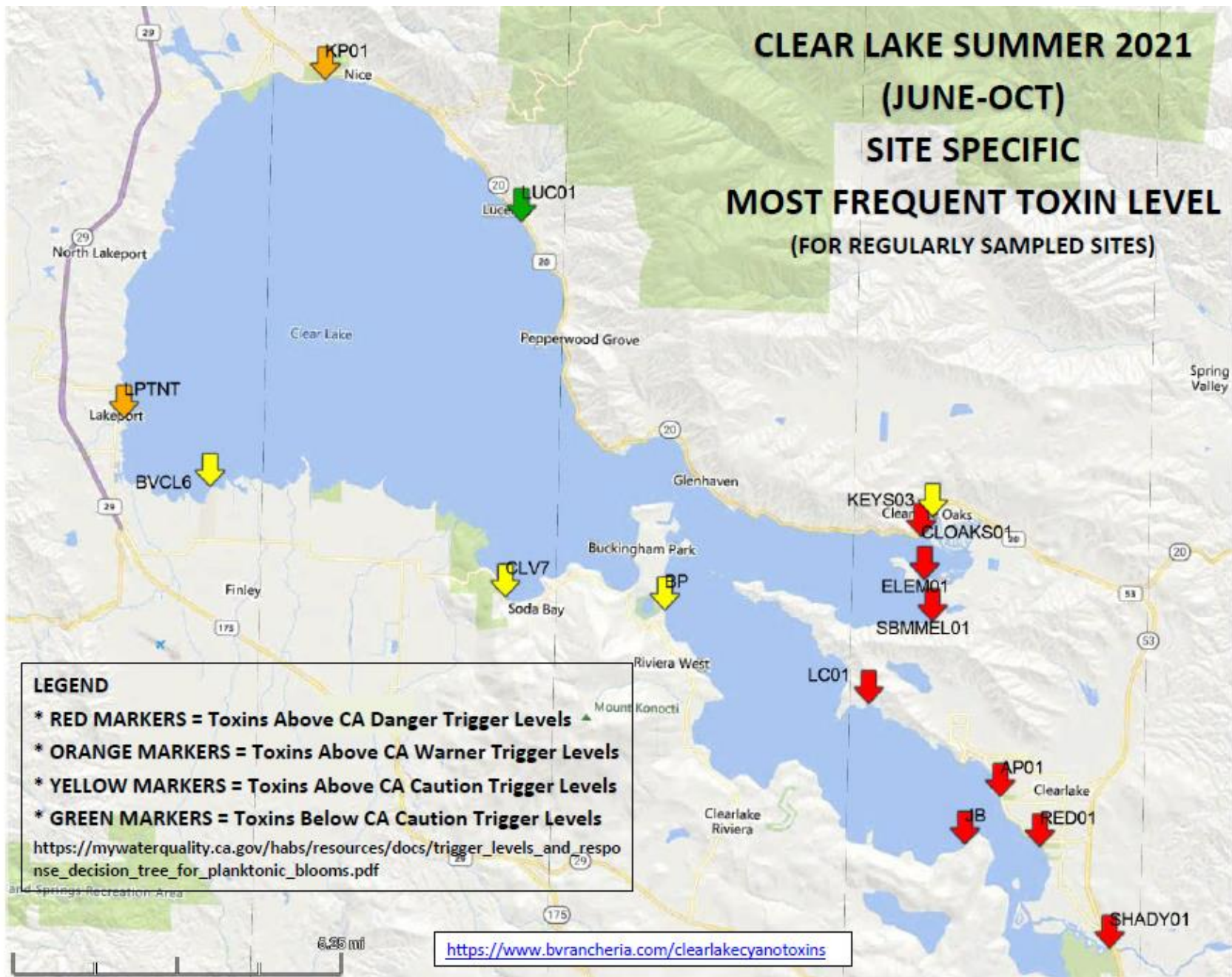
This table shows the results for both Microcystin (MC) and Anatoxin-a (ANA) analysis at each site. Cells that are highlighted red have the highest toxin value that sampling date. Cells that are bolded and dotted are the highest toxin value for that site during the 2021 sampling year.



Summer 2021 Most Sampled Sites Percentage of Times at Elevated Toxin Levels

| SITE ID | ARM | 6/21 | 7/14 | 7/28 | 8/11 | 8/25 | 9/7 | 9/21 | 10/12 | 10/26 | CAUTION | WARNING | DANGER | % OF SAMPLING EVENTS AT C/W/D |
|----------|-----|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|--------|-------------------------------|
| AP01 | L | CAUTION | CAUTION | DANGER | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | 22% | 22% | 56% | 100% |
| BP | L | CAUTION | CAUTION | CAUTION | WARNING | CAUTION | CAUTION | DANGER | WARNING | WARNING | 56% | 33% | 11% | 100% |
| BVCL6 | U | NONE | NONE | CAUTION | NONE | CAUTION | CAUTION | CAUTION | NONE | NONE | 44% | 0% | 0% | 44% |
| CLOAKS01 | O | CAUTION | NONE | WARNING | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | 11% | 33% | 44% | 89% |
| CLV7 | U | CAUTION | NONE | NONE | CAUTION | CAUTION | DANGER | CAUTION | NONE | NONE | 44% | 0% | 11% | 56% |
| ELEM01 | O | DANGER | CAUTION | DANGER | DANGER | DANGER | CAUTION | CAUTION | DANGER | N/A | 38% | 0% | 63% | 100% |
| JB | L | CAUTION | WARNING | WARNING | WARNING | DANGER | DANGER | DANGER | DANGER | CAUTION | 22% | 33% | 44% | 100% |
| KEYS03 | O | WARNING | WARNING | CAUTION | DANGER | CAUTION | CAUTION | N/A | N/A | NONE | 43% | 29% | 14% | 86% |
| KP01 | U | CAUTION | NONE | WARNING | WARNING | CAUTION | WARNING | CAUTION | NONE | NONE | 33% | 33% | 0% | 67% |
| LC01 | L | WARNING | WARNING | WARNING | DANGER | DANGER | DANGER | DANGER | WARNING | WARNING | 0% | 56% | 44% | 100% |
| LPTNT | U | NONE | CAUTION | WARNING | DANGER | DANGER | WARNING | WARNING | CAUTION | CAUTION | 33% | 33% | 22% | 89% |
| LUC01 | U | NONE | NONE | NONE | CAUTION | NONE | CAUTION | NONE | NONE | NONE | 22% | 0% | 0% | 22% |
| RED01 | L | WARNING | DANGER | WARNING | WARNING | DANGER | DANGER | DANGER | DANGER | DANGER | 0% | 33% | 67% | 100% |
| SBMMEL01 | O | CAUTION | CAUTION | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | WARNING | 22% | 11% | 67% | 100% |
| SHADY01 | L | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | DANGER | WARNING | NONE | 0% | 11% | 78% | 89% |

This table shows our most regularly sampled fifteen locations during the summer and late fall months, the cyanotoxin recommendations signage during those months, and the percentage of time that each site was at Caution, Warning or Danger levels of cyanotoxins. Seven of the fifteen sites were at these elevated levels of cyanotoxins every time we sampled: AP01 (Austin Park), BP (Buckingham), ELEM01 (Elem), JB (Jago Bay), LC01 (Lily Cove), RED01 (Redbud Park) and SBMMEL01 (Sulphur Bank Mercury Mine). All but two of the sites were at elevated levels more than 50% of the time we sampled. The map of these sites, along with their most frequent toxin level is below.



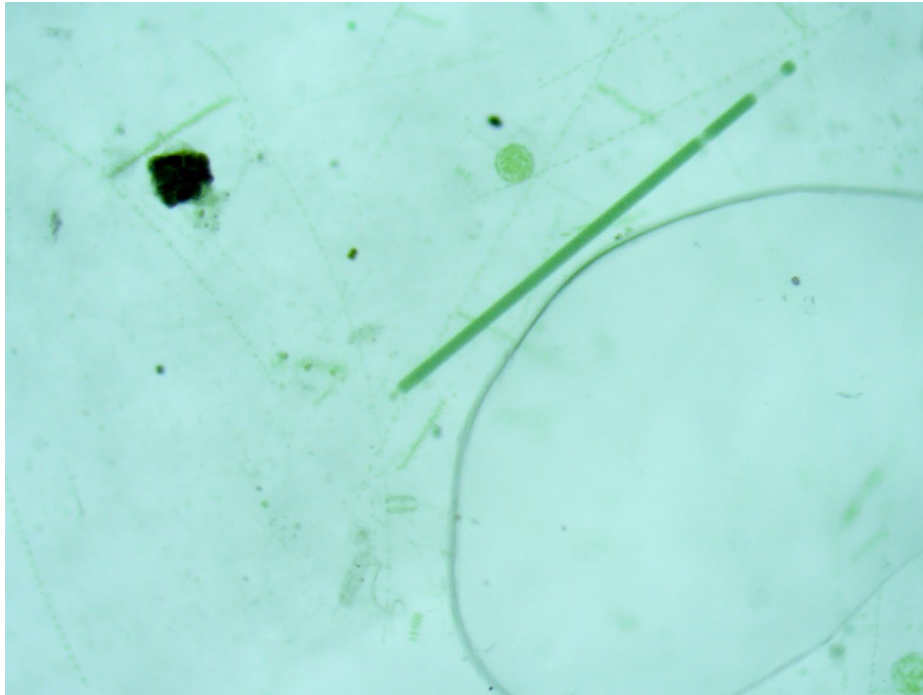


CELL ID TRENDS: 2021

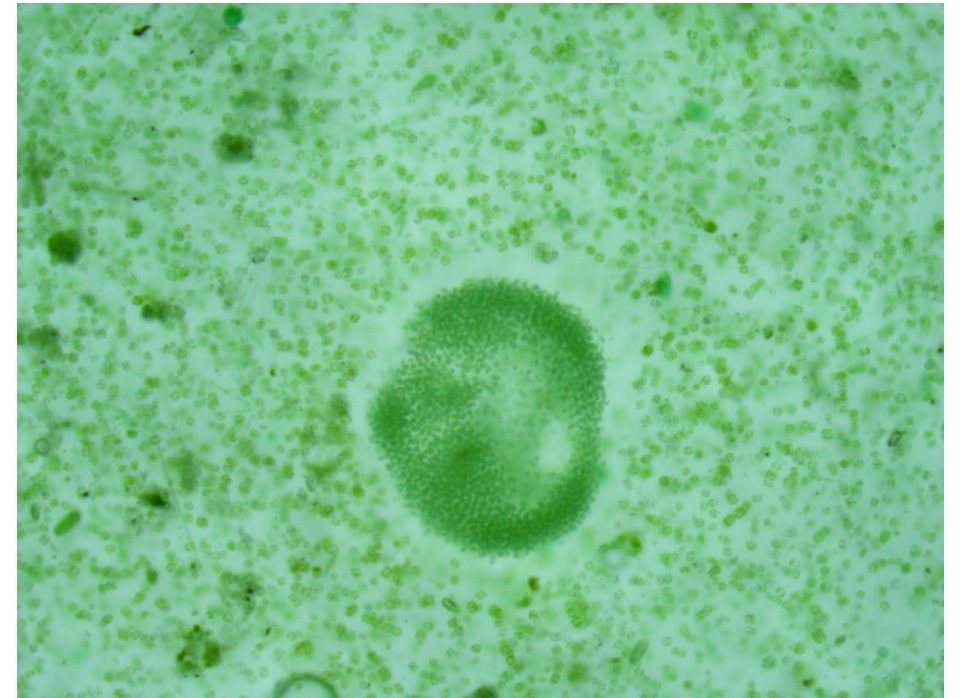
BY: BIG VALLEY RANCHERIA

MARCH, 2021

- Big Valley sampled 10 sites on the shoreline of Clear Lake on a monthly basis
- Microscopy: dominance of *Microcystis* with a secondary dominance of *Lyngbya*.
- Other genera identified: *Pseudanabaena*, *Planktothrix*, *Anabaenopsis*



Lyngbya – RED01: 03/22/2021

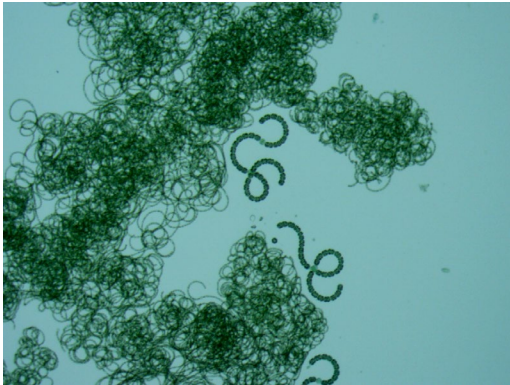


Microcystis - KEYS03: 03/22/2021

APRIL, 2021

- Big Valley continued to sample 10 sites throughout Clear Lake on a monthly basis
- Microscopy: dominance of *Dolichospermum* with a secondary dominance of *Microcystis*.
- Other genera identified: *Aphanizomenon* and *Anabaenopsis*

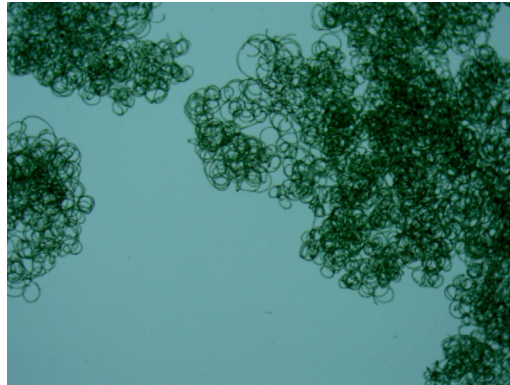
Dolichospermum - LPTNT: 04/27/2021



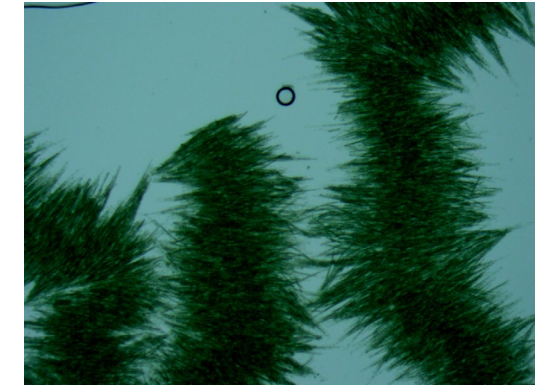
Microcystis - SHADY01: 04/27/2021



Dolichospermum - CLV7: 04/27/2021

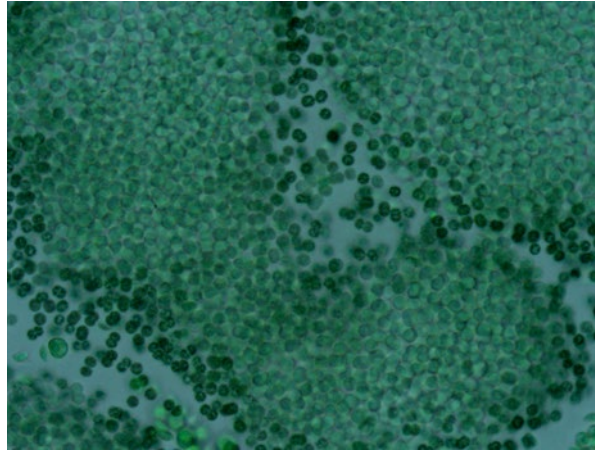


Aphanizomenon - LPTNT: 04/27/2021

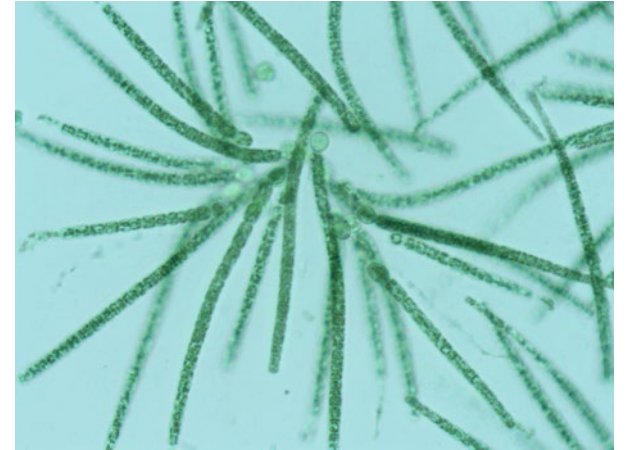


MAY, 2021

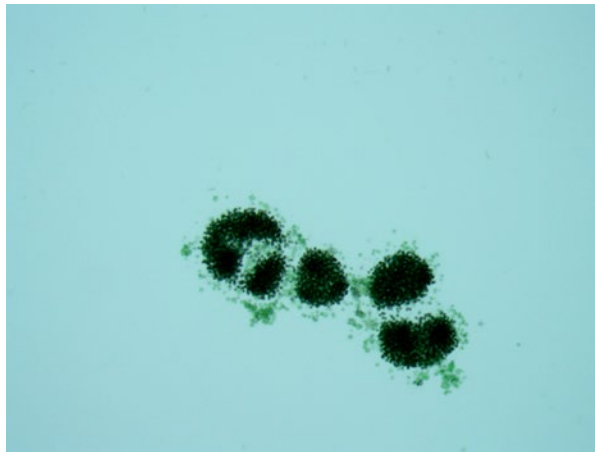
- Big Valley continued to sample 11 sites on the shoreline of Clear Lake on a monthly basis
- Microscopy: dominance of Microcystis and a secondary dominance of Dolichospermum
- Other genera identified: Gloeotrichia



Microcystis - AP01: 05/17/2021



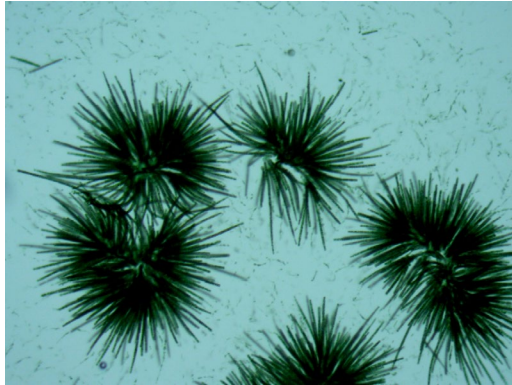
Gloeotrichia - AP01: 05/17/2021



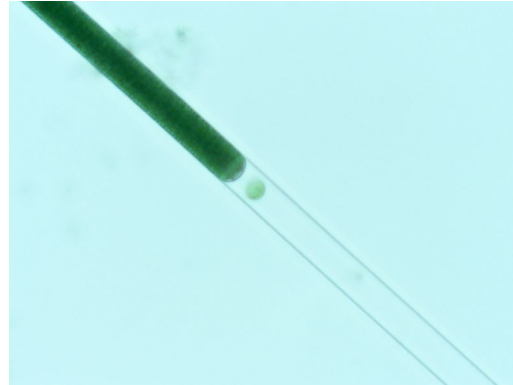
Microcystis - RED01: 05/17/2021



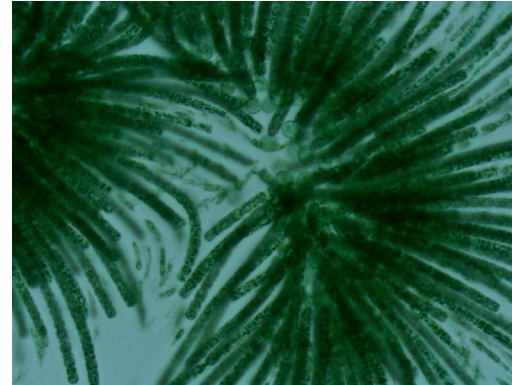
Dolichospermum - BP: 05/17/2021



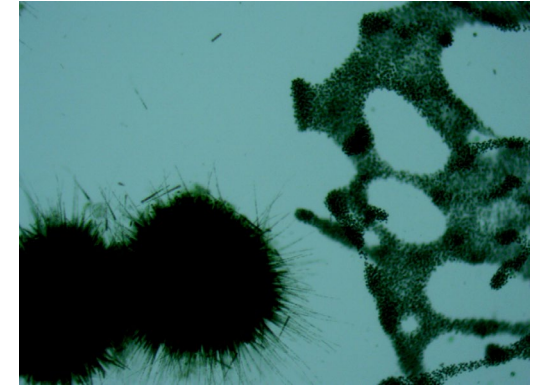
Gloeotrichia – BP: 06/07/2021



Lyngbya – AP01: 06/07/2021



Gloeotrichia – LUC01: 06/07/2021



Gloeotrichia and Microcystis: CLV7
06/07/2021

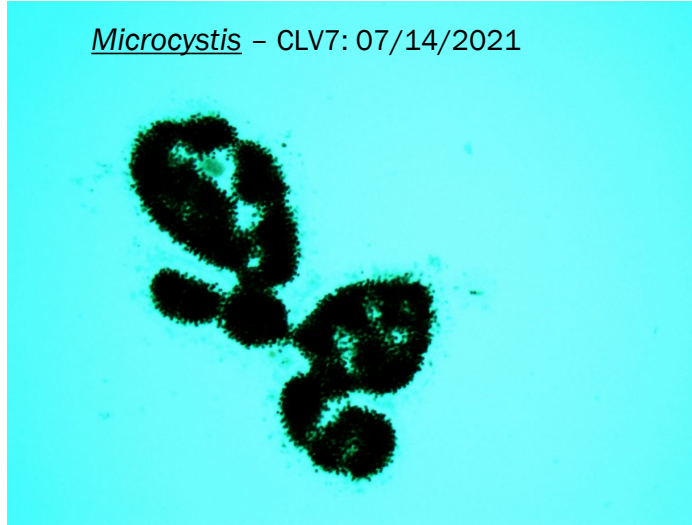
JUNE, 2021

- Big Valley began their bi-monthly Summer HAB monitoring of Clear Lake
- 14 sites were sampled
- Microscopy: dominance of Gloeotrichia and a secondary dominance of Microcystis with Lyngbya in the mix
- Other genera identified: Dolichospermum and Anabaenopsis

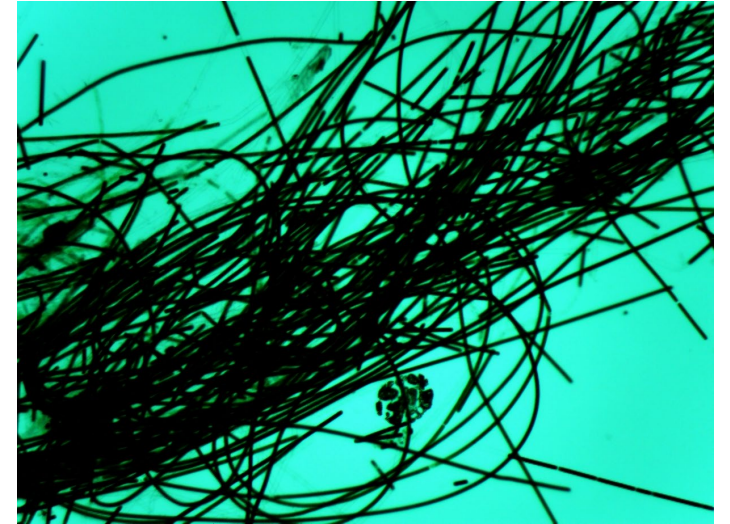
JULY, 2021

- Big Valley continued to sample 15 sites on a bi-monthly basis on Clear Lake
- Microscopy: dominance of *Lyngbya*, and a secondary dominance of *Microcystis*
- Other genera identified: *Gloeotrichia* and *Planktothrix*

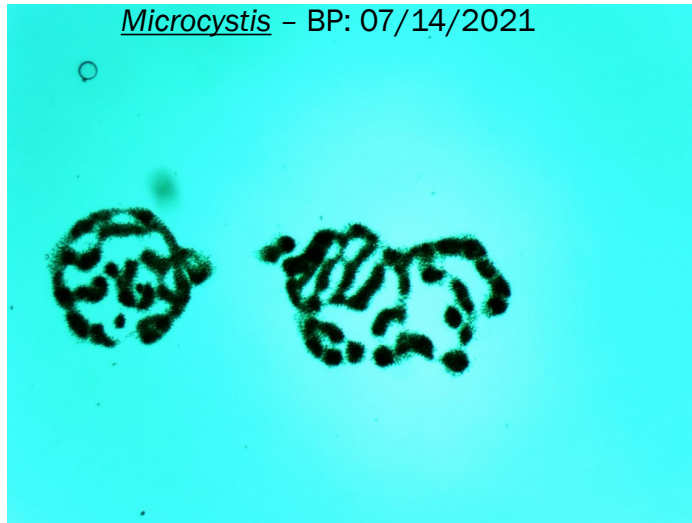
Microcystis - CLV7: 07/14/2021



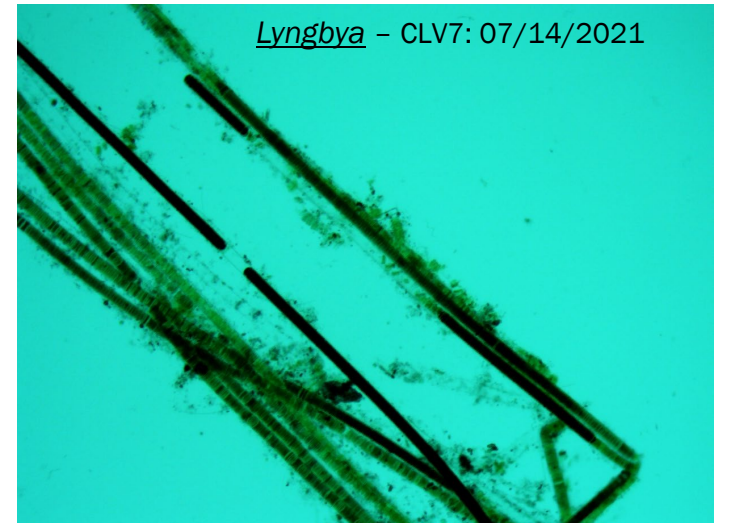
Lyngbya - LC01: 07/14/2021



Microcystis - BP: 07/14/2021

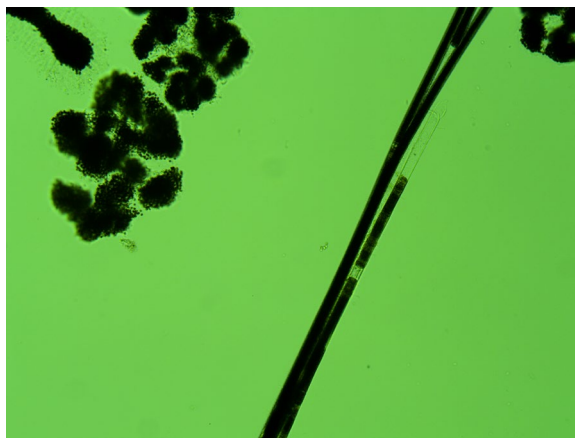


Lyngbya - CLV7: 07/14/2021

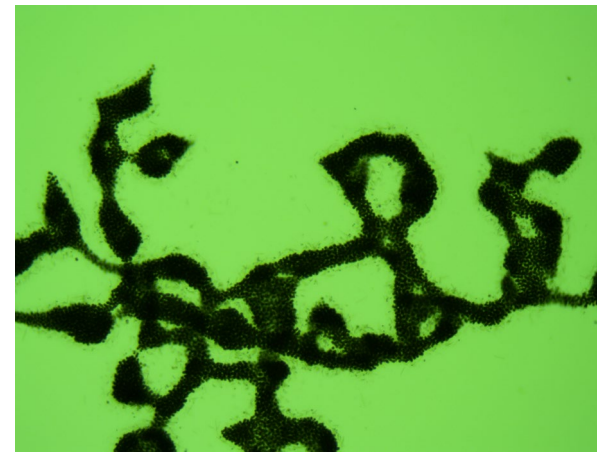


AUGUST, 2021

- Big Valley continued sampling 15 sites on Clear Lake on a bi-monthly basis
- Microscopy: dominance of Microcystis with a secondary dominance of Lyngbya
- Other genera identified: Kamptonema, Phormidium, Planktothrix, and Aphanizomenon



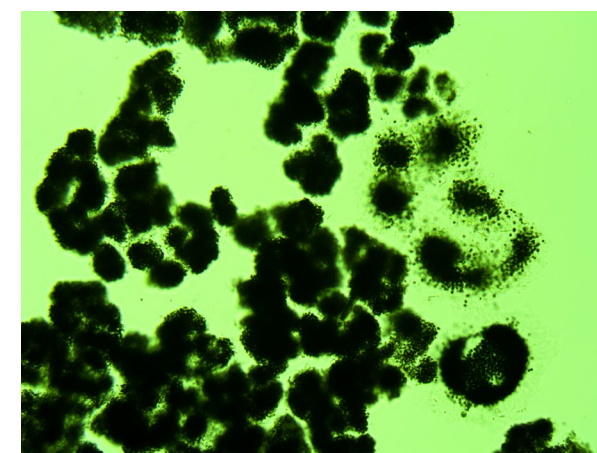
Lyngbya - JB: 08/12/2021



Microcystis - BP: 08/12/2021



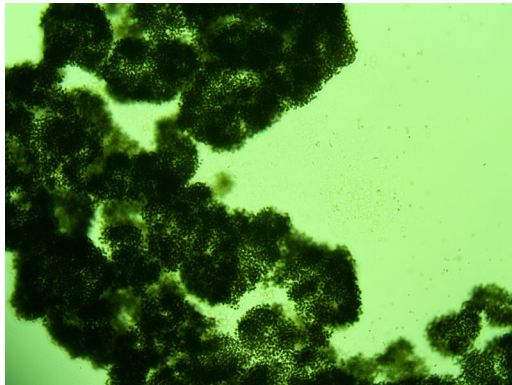
Microcystis - CLOAKS01: 08/12/2021



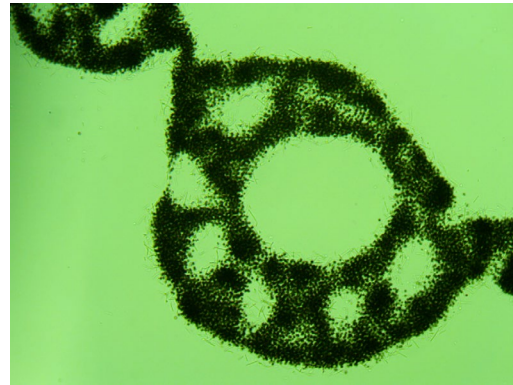
Microcystis - JB: 08/12/2021

SEPTEMBER, 2021

- Big Valley continued to sample 15 sites on a bi-monthly basis around the shoreline of Clear Lake
- Microscopy: dominance of Microcystis with a secondary dominance of Planktothrix
- Other genera observed: Oscillatoria, Pseudanabaena, and Aphanizomenon



Microcystis – KP01: 09/09/2021



Microcystis – BP: 09/09/2021



Planktothrix – LPTNT 09/22/2021

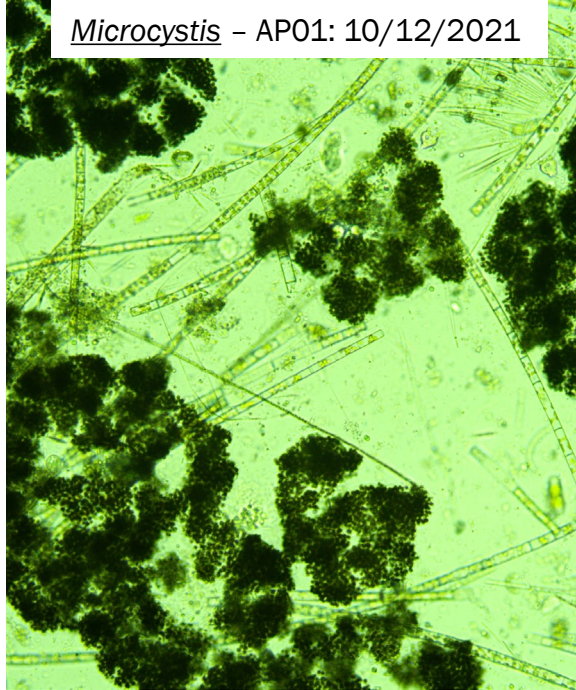


Planktothrix – LPTNT: 09/22/2021

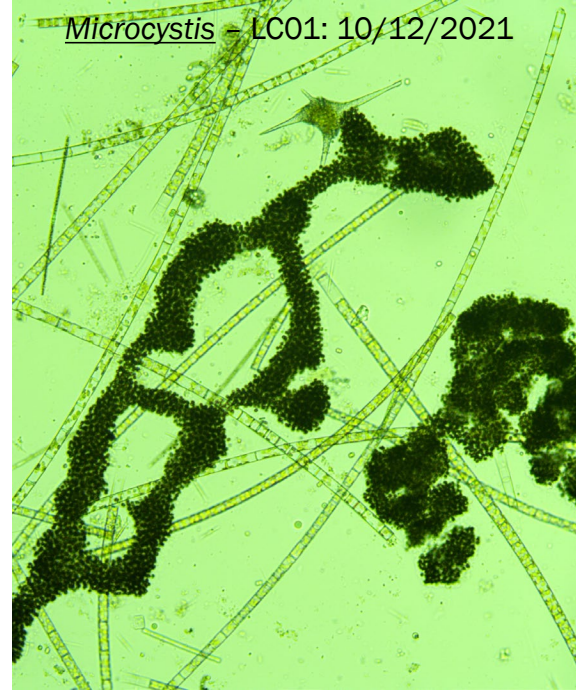
Planktothrix – CLV7: 10/12/2021



Microcystis – AP01: 10/12/2021



Microcystis – LC01: 10/12/2021



Planktothrix – BP: 10/12/2021



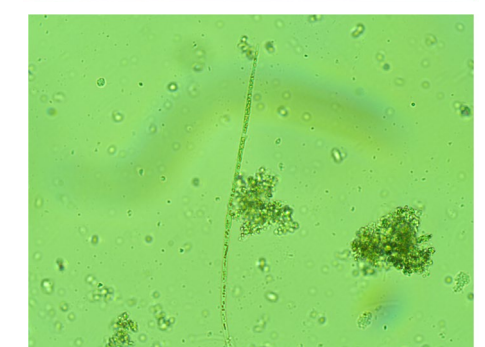
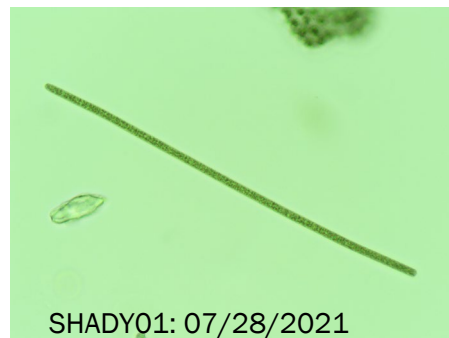
OCTOBER, 2021

- Big Valley continued to sample 15 sites around Clear Lake's shoreline on a bi-monthly basis
- Microscopy: dominance of Microcystis with a secondary dominance of Planktothrix.
- Other genera identified: Woronichinia, Aphanizomenon

2021 ANATOXIN DETECTS AT CLEAR LAKE

- **07/28/2021:** Big Valley was seeing a dominance of *Planktothrix* and *Aphanizomenon* at BVCL6 and SHADY01
- **08/11/2021:** Still seeing an abundance of *Planktothrix* at BVCL6 and SHADY01. LUC01 we were seeing *Aphanizomenon* and at KEYS03 we were seeing *Phormidium*, all possible anatoxin producers.
- **08/25/2021:** SHADY01 and LPTNT had *Planktothrix* as a secondary dominant cyanobacteria. KEYS03 and LUC01 had a dominance of *Kamptonema*.
- **09/07/2021:** SHADY01 had a dominance of *Planktothrix* and *Aphanizomenon*.
- **09/21/2021:** Still seeing *Planktothrix* and *Aphanizomenon* at SHADY01. *Planktothrix* at BVCL6, LPTNT, KP01 and CLV7. We were also seeing some *Oscillatoria* at LC01.
- **10/12/2021:** Still seeing *Aphanizomenon* at SHADY01, Anatoxin level at 35.42 µg/L. 8 other sites had ND of Anatoxin-a.

| DATE | BVCL6 | SHADY01 | KEYS03 | LUC01 | ELEM01 | LPTNT | LC01 | CLV7 | KP01 |
|------------|-----------|------------|-----------|-----------|--------|-----------|-----------|-----------|-----------|
| 07/28/2021 | 2.49 µg/L | ND | | | | | | | |
| 08/11/2021 | ND | 2.63 µg/L | 0.19 µg/L | 0.18 µg/L | | | | | |
| 08/25/2021 | | 12.90 µg/L | 0.14 µg/L | 0.70 µg/L | ND | 0.14 µg/L | | ND | |
| 09/07/2021 | | 25.95 µg/L | 0.30 µg/L | | | 0.27 µg/L | | | |
| 09/21/2021 | 0.17 µg/L | 33.61 µg/L | | | | 0.17 µg/L | 0.32 µg/L | 0.17 µg/L | 0.25 µg/L |



CAUTION - PRECAUCIÓN

**Harmful algae may be present in this water.
Puede haber algas dañinas en estas aguas.**



**Stay away from algae and scum in the water.
Aléjese de las algas o espuma lamosa en el agua.**



Do not let pets and other animals go into or drink the water, or eat scum on the shore.

No deje que sus mascotas o animales se metan o beban el agua, o se acerquen a la espuma lamosa.

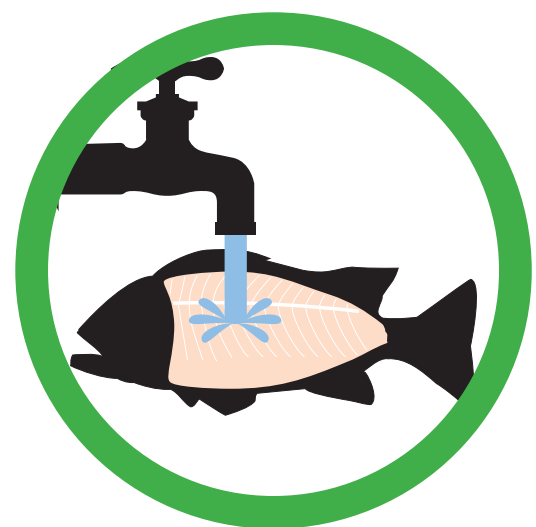


Keep children away from algae in the water or on the shore.
Mantenga a los niños alejados de algas en el agua u orilla del agua.



Do not drink this water or use it for cooking.

No beba de esta agua o use para cocinar.



For fish caught here, **throw away guts and clean fillets** with tap water or bottled water before cooking.

Al pescado que pesque aquí, **quítele los intestinos y tírelos a la basura.** Limpie el filete con agua de la llave o embotellada antes de cocinarlo.



Do not eat shellfish from this water.

No coma mariscos de estas aguas.

Call your doctor or veterinarian if you or your pet get sick after going into the water.
Llame a su médico o veterinario si usted o su mascota se enferman después de meterse al agua.
For more information go to (Para información) : <https://mywaterquality.ca.gov/habs/>
For local information, contact (Para información local comuníquese con):

WARNING - ADVERTENCIA

Toxins from algae in this water can harm people and kill animals
Toxinas de algas en estas aguas pueden causar daño a la gente y matar animales



No swimming.
Prohibido nadar.



Do not let pets or other animals go into or drink the water, or go near the scum.
No deje que sus mascotas o animales se metan o beban el agua, o se acerquen a la espuma lamosa.



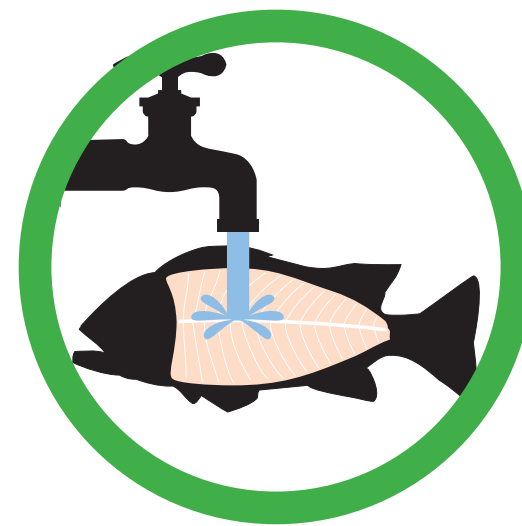
Stay away from scum, and cloudy or discolored water.
Manténgase alejado de la espuma lamosa, y agua turbia o descolorida.



Do not eat shellfish from this water.
No coma mariscos de estas aguas.



Do not use this water for drinking or cooking. Boiling or filtering will not make the water safe.
No use esta agua para beber o cocinar. Hervir o filtrar el agua no hace que sea segura.



For fish caught here, **throw away guts and clean fillets** with tap water or bottled water before cooking.
Al pescado que pesque aquí, **quítele los intestinos y tírelos a la basura.** Limpie el filete con agua de la llave o embotellada antes de cocinarlo.

DANGER - PELIGRO

Toxins from algae in this water can harm people and kill animals
Toxinas de algas en estas aguas pueden causar daño a la gente y matar animales



Stay out of the water until further notice. Do not touch scum in the water or on shore.

Manténganse fuera del agua hasta nuevo aviso. No toque la espuma lamosa en el agua o en la orilla.



Do not let pets or other animals drink or go into the water or go near the scum.
No deje que sus mascotas o animales beban o se metan al agua, o se acerquen a la espuma lamosa.



Do not eat fish or shellfish from this water.
No coma pescados o mariscos de estas aguas.



Do not use this water for drinking or cooking. Boiling or filtering will not make the water safe.

No use esta agua para beber o cocinar. Hervir o filtrar el agua no hace que sea segura.

Call your doctor or veterinarian if you or your pet get sick after going into the water.
Llame a su médico o veterinario si usted o su mascota se enferman después de meterse al agua.
For more information go to (Para información) : <https://mywaterquality.ca.gov/habs/>
For local information, contact (Para información local comuníquese con):

| SITE ID | LOCATION |
|----------|--|
| AP01 | AUSTIN PARK BEACH, CLEARLAKE |
| BP | BUCKINGHAM PARK |
| BVCL6 | BIG VALLEY SHORELINE |
| CL-1+ | UPPER ARM, INTERIOR OF LAKE |
| CL-3+ | LOWER ARM, INTERIOR OF LAKE |
| CL-4+ | OAKS ARM, INTERIOR OF LAKE |
| CL-5+ | MOUTH OF RODMAN SLOUGH, UPPER ARM |
| CLOAKS01 | CLEARLAKE OAKS NEXT TO WATER TREATMENT |
| CLV7 | SODA BAY COVE |
| CP | LAKESIDE COUNTY PARK, SODA BAY ROAD |
| ELEM01 | ELEM SHORELINE |
| GH | GLENHAVEN BEACH |
| HB | HORSESHOE BEND |
| JG | JAGO BAY |
| KEYS01 | CLEARLAKE KEYS, EAST SIDE |
| KEYS03 | CLEARLAKE KEYS, WEST SIDE |
| KP01 | KEELING PARK |
| LC01 | LILY COVE (LOWER ARM) |
| LA-03* | LOWER ARM, INTERIOR OF LAKE |
| LPTNT | 1ST ST. BOAT RAMP, LAKEPORT |
| LS2 | LAKESHORE DRIVE, LAKEPORT |
| LUC01 | LUCERNE HARBOR PARK |
| NR-02* | NARROWS, INTERIOR OF LAKE |
| OA-04* | OAKS ARM, INTERIOR OF LAKE |
| RED01 | REDBUD PARK, CLEARLAKE |
| RODS | RODMAN SLOUGH |
| SBMMEL01 | SULPHUR BANK MERCURY MINE SUPERFUND SITE |
| SC01 | CLEARLAKE KEYS, MOUTH OF SCHINDLER CREEK |
| SHADY 01 | SHADY ACRES (CACHE CREEK) |
| UA-01* | UPPER ARM, INTERIOR OF LAKE |
| UA-06* | UPPER ARM, INTERIOR OF LAKE |
| UA-07* | UPPER ARM, INTERIOR OF LAKE |
| UA-08* | UPPER ARM, INTERIOR OF LAKE |
| | |
| * | UC DAVIS LAKE STUDY SITE |
| + | CA DEPT OF WATER RESOURCES SAMPLING SITE |

